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AUTHOR Johnson, Richard D.; And Others
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ABSTRACT

Processes involved in making estimates of the value of missing information that could help in a decision making process were studied. Hypothetical purchases of ground beef were selected for the study as such purchases have the desirable property of quantifying both the price and quality. A total of 150 students at the University of Iowa rated the desirability of each of a series of ground beef purchases described by the cost and the quality (the percentage of fat or lean meat) of the beef. The subjects rated 24 purchases containing complete information and 24 containing incomplete information. The missing information component involved provision of information only on the price or only on the quality. The students were placed in positive or negative framing conditions involving characterization of the meat by lean content and by fat content, respectively. Data from the students' ratings of purchases indicate that: purchases are evaluated more favorably when information is framed positively, consumers place great confidence in their estimates and treat them as if they were veridical when they are asked to estimate missing values, and consumers' judgments are affected by the way objective information is framed and by the extent to which they are encouraged to use their previous experiences to infer the value of missing information. One table and eight graphs are presented. (TJH)

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Relying on Your Own Best Judgment:

Imputing Values to Missing Information in Decision Making

Richard D. Johnson
University of Chicago[1]

Irwin P. Levin and LuAnne J. Cressey
The University of Iowa

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[1] Reprint requests, comments, and inquiries may be addressed to the first author at his new address: Dep't of Marketing and Economic Analysis, 3-23 Faculty of Business Building, University of Alberta, Edmonton, Alberta T6G 2R6, Canada.

Most judgments and decisions in the real world must be made with limited information. It is rarely the case that values are known for all the important attributes. Some time ago, we proposed a model for such judgments in which we suggested that the missing attribute is not forgotten or ignored. Instead, the known information is used to infer some value for the missing attribute (Huber and McCann 1982; Yamagishi & Hill 1981; Levin, Johnson and Faroane 1984; Johnson and Levin, 1985). Imagine, for example, you are buying a used car and the salesman doesn't know how many miles per gallon of gasoline it gets. According to the inference model, you might infer a value for MPG based on other things you know about the car, such as the size of the engine or the type of transmission, as well as on certain aspects of the context. Context effects include such factors as the reason the information is missing, the amount of uncertainty, and the manner in which the item is described or framed.

In the present study, inferences were made explicit. Subjects in some conditions were required to write down their best estimate of the value of the missing information before they rated the partially described items. This process was expected to make the inference more salient, thereby increasing its impact on the judgment. Furthermore, the influence of this procedure on previously reported framing effects was explored.

Hypothetical purchases of ground beef were selected for the present study for several reasons. Ground beef purchases have the desirable property of quantifying both the price and quality

dimensions. Furthermore, the quality dimension can be alternatively framed in positive terms (percentage of lean) or negative terms (percentage of fat). Finally, consumers are familiar with advertisements of ground beef that contain either both price and quality information or only one of these sources of information.

Method

Experimental Design

Subjects were asked to rate the relative desirability of each of a series of ground beef purchases described by the cost (price per pound) and the quality (percentage of fat or lean) of the beef, or by only one of these values. Costs varied from $.80 to $1.80 per pound and quality varied from 15% fat/85% lean to 40% fat/60% lean in a representative design (see Table 1).

Insert Table 1 About Here

Framing Conditions. Half the subjects were assigned to the Positive Framing Condition, where quality was expressed in terms of percentage of lean, and half were assigned to the Negative Framing Condition, where quality was expressed in terms of percentage of fat.

Inference Conditions. Within each framing condition one-third of the subjects were assigned to each of three different instructional conditions concerning their responses to trials with missing information (i.e. price-only and quality-only

trials). Subjects in the Implicit Inference Condition were asked to rate both partially and completely described purchases without any intervening steps. Subjects in the Explicit Inference Conditions were asked to write in their estimate of missing price or quality values before rating a partially described purchase. In the Quantitative Explicit Inference Condition subjects were asked to write in a dollars and cents figure for their best estimate of price for each purchase where only a quality value was given, and they were asked to write in a percentage of fat or a percentage of lean value for each purchase where only a price value was given. In the Qualitative Explicit Inference Condition subjects were asked to express their best estimates of missing values in terms of relatively broad categories. The choice of verbal categories ranged from "very expensive" to "very inexpensive" and from "very high quality" to "very low quality".

Subjects

Research participants were 150 students from introductory psychology courses at The University of Iowa. Twenty-five students were assigned randomly to each of the six combinations of instructional conditions and framing conditions.

Procedure

Subjects were asked to rate on scale of 1 to 20 the relative desirability of each ground beef purchase. Across the two replications of the design, subjects rated a total of 48 purchases, 24 of them containing complete information and 24 containing incomplete information.

When subjects were faced with partially described items, we did not want them to merely reproduce the stimulus combinations presented for the completely described items. As a preventative measure, all the partially described items were presented before any of the completely described items. Within each level of information, the various purchases were presented in random order. The different purchases were said to represent newspaper advertisements for different grocery stores, where some advertisements may contain more information than others.

Subjects in the Implicit Inference Condition were told to base their rating responses on the available information for each trial. Subjects in the Explicit Inference Conditions were told to fill in their estimate of the missing value before rating a given purchase, and to base their rating on both the presented information and their estimates of the missing information.

Results

There were no systematic differences between the responses of interest in the Quantitative and Qualitative Explicit Inference Conditions, so these two conditions were combined in the analyses that follow. Of primary interest are comparisons between Explicit and Implicit Inference Conditions and comparisons between Positive and Negative Framing Conditions on the ratings of complete and partially described purchases.

Before turning to these comparisons, let us briefly describe the inferences themselves. In both Explicit Inference Conditions across both Framing Conditions, there was a strong tradeoff

relationship perceived between price and quality. As quality increased on quality-only trials, price was perceived to increase. As price increased on price-only trials, quality was perceived to increase.

The main results are plotted in Figures 1 and 2. Figure 1 plots mean rating responses for each condition for trials on which price and quality information is given (solid lines) and trials in which only quality information is given (dotted lines). A comparison between the right and left panels of Figure 1 reveals that responses were significantly higher in the Positive Framing Condition than in the Negative Framing Condition.

Insert Figure 1 About Here

Noticeable in each panel of Figure 1 is that responses were higher for high price-high quality combinations than for low price-low quality combinations. This indicates that information about quality received more weight than information about price in these judgments.

Figure 2 plots mean rating responses for trials on which only price information is given. These data clearly show the difference between Implicit and Explicit Inference conditions. In the Implicit Inference Condition [top panels] desirability ratings decreased as price increased. In the Explicit Inference Condition [bottom panels] ratings increased as price increased. These trends are relatively invariant across framing conditions.

The finding for the Explicit Inference Conditions is consistent with the previously reported finding that explicit inferences reflect the perception that high quality goes with high price (Levin, et al. 1984; Levin, Johnson, Russo and Deldin 1985).

Insert Figure 2 About Here

Furthermore, the range of mean ratings in the Explicit Inference Condition was at least as great when quality values were inferred by the subject as when quality and price were both formally presented. This indicates that subjects placed at least as much weight on their own inferred values of quality as they did on the presented values.

Discussion

The most important finding of this study is that ratings of purchases with missing quality information differed in the Implicit and Explicit Inference Conditions. In the Implicit Condition ratings decreased with increasing levels of price for purchases described by price information only. In the Explicit Inferences Condition ratings actually increased with increasing price on these trials. This was due to the fact that the desirability of low price was overridden by the explicit inference that low quality goes with low price. An analogous finding was not obtained for purchases for which price was the missing attribute. The reason for this asymmetry is that in this particular consumer judgment task, quality received more weight

than price. Because of this, both inferred and presented values of quality take precedence over values of price from either source. The general principle appears to be that the more crucial a source of information is, the more important are the inferences consumers make when that source of information is unavailable. In the case of price-quality judgments these inferences appear to be based on the assumption that "you get what you pay for."

The second important finding in this study is that purchases are evaluated more favorably when information is framed positively (% lean) than when the same information is framed negatively (% fat). We have previously suggested that this occurs because the positive frame tends to induce favorable associations, such as good tasting ground beef; whereas, the negative frame tends to induce unfavorable associations, such as greasiness (Levin, Johnson, Russo and Deldin 1985; Levin, Johnson, Deldin, Carstens, Cressey, & Davis 1986; also see Tversky and Kahneman 1981, and Bazerman and Neale 1982 for similar results and an alternative interpretation).

Finally, the present results indicate that when consumers are asked to estimate missing values, they place great confidence in their estimates and treat them as if they were veridical. Thus it appears that consumers' judgments are affected both by the way objective information is framed, and by the extent to which consumers are encouraged to use their previous experiences to infer the values of missing information.

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Table 1: Representative Design of Price and Quality Levels

	Price					
% Fat	$ .80	$1.00	$1.20	$1.40	$1.60	$1.80
40%	X	X				
35%	X	X				
30%			X	X		
25%			X	X		
20%					X	X
15%					X	X

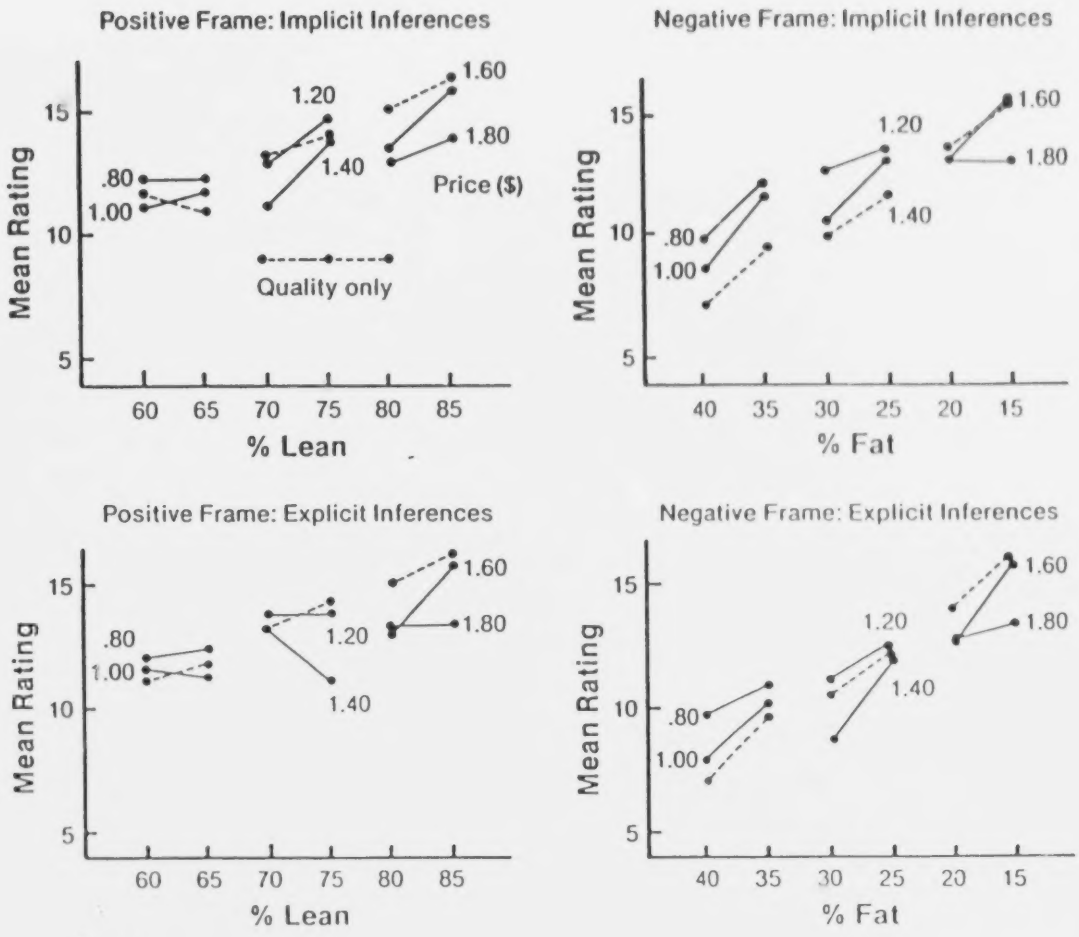

FIGURE 1
Mean ratings in each experimental condition for price-quality combinations (solid lines) and quality-only presentations (dotted lines).

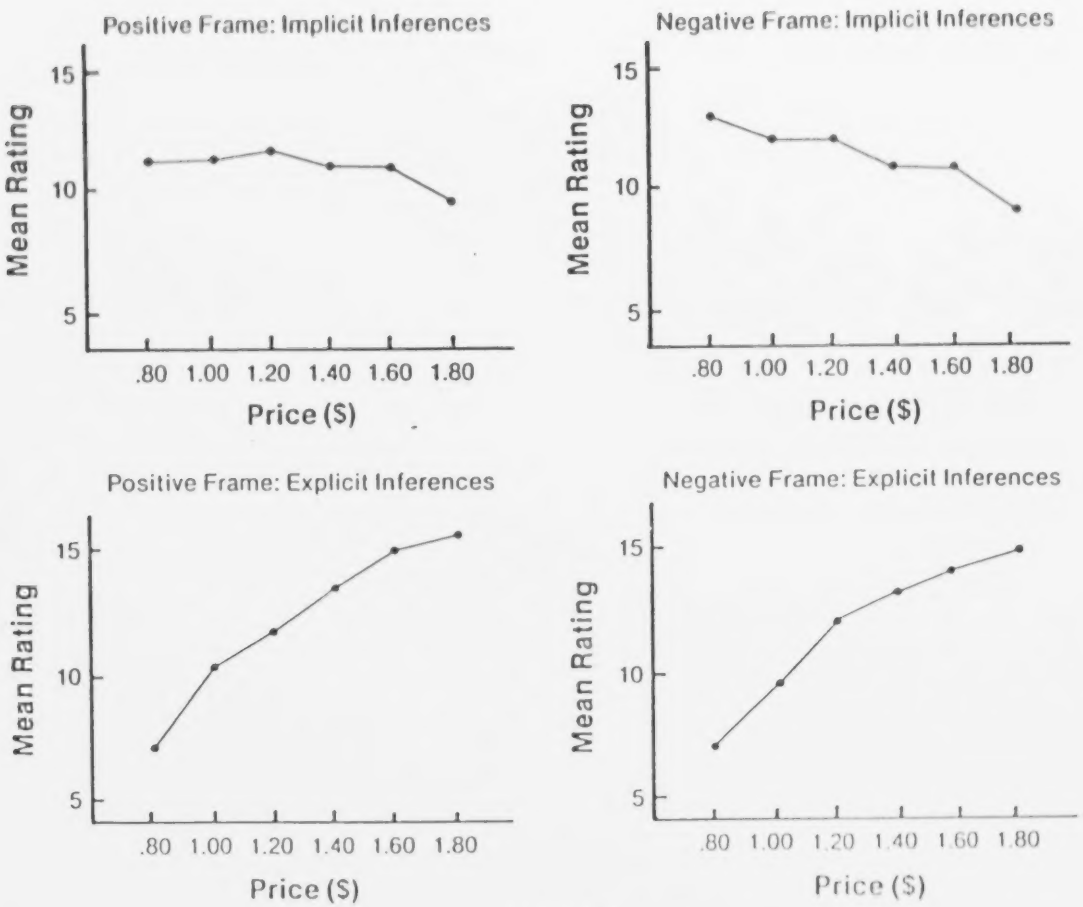

FIGURE 2

Mean ratings in each experimental condition for price-only presentations.